University of Houston Clear Lake

College of Science and Engineering
Engineering Department

Spring 2018
EMGT 5731: Business Analytics

IMPORTANT COURSE POLICIES
- A week starts from Tuesday and ends on Monday. Hence, <u>all weekly assignments are due by Mondays</u> unless there are other announcements.
- All emails should copy the <u>teaching assistant (TA)</u> for a prompt response.
- I and TA are trying to be responsive to your email. TA should be dedicated to this class only for 20 hours per week. You should expect to receive a response from TA first and I may send an extra response to complement his/her response if needed.
- I am doing my best to be responsive. However, it is reasonable <u>not</u> to expect to receive a response from me during weekends. <u>You should contact TA during weekends but still copy me</u>.
- Read the <u>no late assignment acceptance</u> policy carefully

Course Description
Business analytics refers to how enterprises transform data into actionable information and thus support better decision making. It can be applied to a wide range of business functions such as strategic planning, operations, marketing, and finance. Business analytics has become an integral part of modern management, enabling managers to understand data and how to derive insights based on the data. There are two objectives of this course: 1) to foster critical thinking about the data and the type of analytics applied on them, and 2) to teach students how to identify business opportunities with business analytics. This course will focus on three main foundation areas of business analytics: reporting, visualization and prediction. This course will demonstrate business analytics in practice with latest technologies. The student would be able to identify opportunities where business analytics can be applied for performance improvement and better decision making. Students will obtain valuable experiences by practicing with guided case studies and exercises.

Prerequisite: Foundation courses (3 CR)

Course Learning Outcomes
Upon completion of this course, students will be able to:

- Analyzing data with critical thinking to create information and knowledge for business decisions
- Familiar with SAP analytics tools including SAP BusinessObjects Analysis, SAP Crystal Reports, SAP Predictive Analytics, SAP BusinessObjects Design Studio
- Basic knowledge of SQL
- Familiar with data visualization tools such as Tableau, dashboards
- Generate professional reports for business users
- Apply data mining techniques such as Weka for business insights

Class Information

Section	Time	Classroom
EMGT 5731-01 (face-to-face)	7:00 PM – 9:50 PM on Tuesday	Room 203 in Delta

Required Teaching Materials

Textbook

Practical Analytics, 1st edition 2015, Nitin Kale and Nancy Jones, Epistemy Press. ISBN: 978-0-9856008-9-1. No printed copies. Available for purchase at
http://epistemypress.com/books/practical-analytics/

Software
- *SAP GUI 7.40 for Windows*
- *SAP BW*
- *SAP Business Explore Query Designer*
- *SAP BusinessObjects Design Studio*
- *SAP Predictive Anlytics*
- *SAP Crystal Reports*
- *SAP Explorer*
- *SAP Lumira*
- *Microsoft Excel and Access*
- *Teradata*
- *Tableau*
- *Weka*

Instructor Information

Professor	*Xiaojun (Gene) Shan*, Ph.D.
Bio	Dr. Shan received his PhD in Industrial and Systems Engineering from University at Buffalo, State University of New York and has published more than 10 papers in top journals. His research interests include healthcare delivery systems, energy systems, and risk management against natural and man-made disasters.
Office	Room 6 at Delta Annex Building, 2700 Bay Area Blvd, Houston, TX 77058
Contact	281-283-3814; shan@uhcl.edu
Office hours	2:00 PM – 4:00 PM on Tuesday/Thursday; Others by appointment
Others	Email is the preferred method of communication – I am trying to be very responsive. If you leave a telephone message, please be sure to leave your name, the class name and section number, a return phone number and appropriate times for return phone calls.

Student Responsibilities

Time Commitment
This is a 3-credit course for 15 weeks, equivalent 45 semester hours. In order to meet accreditation standards, on average, students should expect to spend between 15 to 20 hours per week on course activities and assignments. Spending less time would be insufficient for success in this course.

Academic Honesty
The University of Houston Clear Lake has a "0" tolerance policy for academic dishonesty and if the student is in violation an "F" for the course will be apply. Please refer to the UHCL academic honesty policy.

Dropping Course
Students may drop a course through the registration process and may receive a refund during the first week of classes. After the first week students need to notify the instructor and then withdraw from the course as faculty will not drop or withdraw a course for students. Please refer to the academic calendar for the exact dates and also review the withdrawal policy
https://www.uhcl.edu/academics/resources/academic-calendar/

Counseling Services
Counseling assistance will be available on Tuesday and Thursdays by appointment

Technical Assistance
Help Desk Hours -
Monday through Thursday 8 A.M. to 10:30 P.M.
Friday 8 A.M. to 5 P.M.
Saturday 8 A.M. to 5 P.M.
Sunday Closed
Email: supportcenter@uhcl.edu
Phone: (281) 283-2828

From Student and Educational Services-Students with Disabilities
If you wish to receive special accommodations as a student with a documented disability, please make an appointment with the Disability Services at ext. 2626 or Students service building Room 1301

Course Progress
Considering the diverse course format and intensity, it is strongly recommended that you complete all required readings prior to the class.

Late Assignment and Make-up Exam Policy
There is no make-up exam allowed.
Late submission not accepted – no exception.
Further, requesting replacement of any submitted assignment will not be accepted (In the past, we received too many claims that they had submitted wrong files, etc.)

Grading Policy

Grading Scale and guidelines
Your grade will be determined by the following four components:

a. Individual Assignments (30%)
b. Case Studies (15%)
c. Midterm (25%)
d. Final (30 %)

Scale

A 93-100%	A- 88-92.99%	
B+ 86-87.99%	B 83-85.99%	B- 80-82.99%
C+ 77-79.99%	C 73-76.99%	C- 70-72.99%
F < 70%		

Exams/Project
Exams
written, in-class tests. They are designed to test students' understanding of concepts not applications of specific techniques.

Individual assignments
Computer-based and hands-on applications of analytics tools.

Case Studies
To test understanding of real business cases and analysis based on data and quantitative reports derived from the data

Course Outline

Week 1 – Course Introduction

- Course objectives and outcomes
- Making the case for analytics
- Data driven decision making
- Introduction to data analytics

– Data provisioning

- Source systems
- Data collection and staging
- Data representation for structured and unstructured data

Reading: *Chapters 1 and 2*
Assignment: Explore various data sources – flat files, relational database, data warehouse, in-memory database, XML
Due Date: Week 2

Week 2 – Data modeling for data staging

- Transactional systems vs. informational systems
- Data warehouses
- Multidimensional modeling
- Star schema and snowflake schema
- Fact and dimension tables

Reading: *Chapter 3*
Assignment: Explore and understand the extended star schema for GBI in SAP BW.
Due Date: Week 3

Week 3 – Extraction, transformation and loading

- Extraction from source systems
- Data cleansing and transformation
- Loading data and automation

Reading: *Chapter 4*
Assignment: Explore the ETL process for GBI's data warehouse
Due Date: Week 4

Week 4 – Slicing and Dicing

- Basics of slicing and dicing
- Pivot tables
- Working with aggregation functions, hierarchies
- Exceptions and conditions
- Slicing and dicing multidimensional data (from cubes)

Reading: *Chapter 5*
Assignment: Answer business questions by slicing and dicing multidimensional data from a

data warehouse data source.
Due Date: Week 5

Week 5 - Reporting
- What are reports? Where are they used?
- Building reports from one or more data sources
- Formatting reports
- Creating summaries

Reading: *Chapter 6*
Assignment: Create a formatted report based on live financial data (from SAP ERP) using SAP Crystal reports. Use SAP Crystal Reports to connect to a data warehouse, then author a monthly report that show the accounts receivables from customers.
Due Date: Week 6

Week 6 – Data Visualization: Basic Charts
- Visualization as a powerful tool for analytics
- Types of charts
- How to choose the right chart for displaying data
- Multi variable data display

Reading: *Chapter 7*
Assignment: Use data visualizations to gain insights into team performance from the ERP Sim business simulation.
Due Date: Week 7

Week 7 – Dashboards:
- What are dashboards, cockpits, scorecards?
- How to author dashboards?
- Adding interactivity
- Deploying dashboards
- Mobile Apps for Analytics

Reading: *Chapter 8*
Assignment: Model and implement a dashboard for key performance indicators for a company. Build an analytics mobile app based on data from a data warehouse. Test it on your mobile device.
Due Date: Week 8

Week 8 – Advanced Visualization:
- Advanced chart types
- Infographics: How to tell a data driven story
- Mashups

Reading: *Chapter 9*
Assignment: Build an infographic based on data of your choice. Infographic should communicate findings in a compelling way.
Due Date: Week 9

Week 9 - Midterm Exam

Week 10 – Knowledge Discovery
- Data mining
- Accuracy in data mining
- Data mining process
- Machine learning

- Descriptive vs. predictive analytics

Reading: *Chapter 10*
Assignment: Use SAP Predictive Analytics to model a data mining process from data acquisition to model validation.
Due Date: Week 11

Week 11 – Descriptive data mining
- Models for descriptive data mining
- Clustering
- Association analysis

Reading: *Chapter 11*
Assignment: Use SAP Predictive Analytics to analyze various real world scenarios
Due Date: Week 12

Week 12 – Predictive data mining
- Models for predictive data mining
- Regression
- Decision trees
- Classification
- Forecasting, time series analysis

Reading: *Chapter 12*
Assignment: Analyze the multibillion row database from Walmart provisioned by University of Arkansas.
Due Date: Week 13

Week 13 – Big data: Hype or helpful?
- What is big data?
- Challenges and promises of big data
- Limitations and missteps of big data

Reading: *Chapter 13*
Assignment: Research a big data use case.
Due Date: Week 14

Week 14 – Analytics in the Decision Cycle
- How does data analysis support decision making?
- Automating analysis using advanced technologies.
- Business cases using manual and semi-automated analysis

Assignment: Use skills from the previous 13 chapters to analyze data and make recommendations to improve business operations.
Due Date: Week 15

Week 15 – Final Exam